

ABSTRACT

A method of fabricating a metal-oxide semiconductor (MOS) transistor with low gate depletion and high gate drivability in nitride read only memory (NROM). This method creates a MOS transistor by forming a gate including a silicon oxide layer, an amorphous silicon layer, and a silicon germanium layer. A nickel layer is formed on the top surface of the gate. A rapid thermal annealing process causes the nickel layer and the silicon germanium layer to react and form a nickel silicide layer. This process will lessen the effect of gate depletion, since the formation of nickel silicide consumes relatively few silicon atoms, and the rapid thermal annealing process diffuses germanium atoms from the silicon germanium layer into the amorphous silicon layer and increases the concentration of dopant in the gate.